Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Ligado Request that the Commission Initiate a Rulemaking to Allocate the 1675 – 1680 MHz Band for Terrestrial Mobile Use Shared with Federal Use	)	RM-11681

COMMENTS OF NORTHSTAR WIRELESS, LLC

Northstar Wireless, LLC ("Northstar Wireless"), by its attorneys and pursuant to Section 1.415(a) of the Commission's Rules, 47 C.F.R. § 1.415(a), submits these comments in response to the Public Notice, DA 16-443, released on April 22, 2016,[1] seeking input to refresh the record on the 2012 proposal by Ligado Networks ("Ligado") to repurpose the 1675 – 1680 MHz band for terrestrial mobile downlink transmissions.[2]

I. INTRODUCTION

As the Commission considers whether to initiate a rulemaking on the Ligado Proposal, it should carefully consider the consequences of the implementation of that proposal on AWS-3 commercial licensees. Northstar Wireless is the licensee of 261 AWS-3 licenses, including 92 licenses to conduct mobile uplink operations in the 1695 – 1700 MHz band and 81 licenses to conduct mobile uplink operations in the 1700 – 1710 MHz band. Adoption of the Ligado

[1] *Public Notice: Comment Sought to Update the Record on Ligado's Request that the Commission Initiate a Rulemaking to Allocate the 1675–1680 MHz Band for Terrestrial Mobile Use Shared with Federal Use*, RM-11681, DA 16-442 (Apr. 22, 2016) ("*Ligado Public Notice*").

[2] LightSquared Subsidiary LLC Petition for Rulemaking to Allocate the 1675 – 1680 MHz Band for Terrestrial Mobile Use, Petition for Rulemaking, RM-11681, at 7 (filed Nov. 2, 2012) ("Ligado Petition"). The Ligado Petition was submitted by Ligado's predecessor LightSquared Subsidiary LLC. The proposal set forth in the Ligado Petition, as modified by the Waldron letter (see note 5), is herein referred to as the "Ligado Proposal."

Proposal to use the 1675 – 1680 MHz band for terrestrial mobile downlink transmissions would result in additional co-channel and adjacent channel interference to government satellite operations, limit the number of AWS-3 mobile units that may be operated in affected locations, and permit Ligado—or whomever ultimately acquires the rights it seeks—to benefit from others' contributions toward federal users' spectrum sharing costs. Accordingly, the Commission should ensure that any resulting rulemaking proceeding includes robust measures to protect the investments and operations of these existing licensees.

II. BACKGROUND

Ligado first petitioned the Commission to add a primary allocation to the 1675 – 1680 MHz band for terrestrial downlink operations in November 2012.[3] That request presented 1675 – 1680 MHz terrestrial downlink operations "as an alternative to the deployment of terrestrial downlinks in the 1545 – 1555 MHz portion" of the band.[4] Ligado's original request to operate terrestrial downlinks in the 1545 – 1555 MHz band apparently raised interference concerns among GPS providers, with whom Ligado subsequently negotiated a settlement on the matter.[5] As a result of that settlement, Ligado asked the Commission to "move forward with reallocation and auction of the 1675 – 1680 MHz band, including license conditions that will permit the licensee to use that spectrum on a shared basis and in ways that accommodate the concerns of [the National Oceanic and Atmospheric Administration ("NOAA")]."[6]

---

[3] *See* Ligado Petition at 1.

[4] *Id*. at 3.

[5] *See* Letter from Gerard J. Waldron, Counsel to New LightSquared, to Marlene H. Dortch at 1, IB Docket No. 12-340; IB Docket No. 11-109; IBFS File Nos. SAT-MOD-20120928-00160; SAT-MOD-20120928-00161; SES-MOD-20121001-00872, at 1 (filed Dec. 31, 2015) ("*Waldron Letter*").

[6] *Id.*

The Commission's existing rules establish a 5 MHz allocation for terrestrial wireless broadband services in the 1670 – 1675 MHz band. Adoption of the Ligado Proposal would add to that allocation the adjacent 5 MHz block at 1675 – 1680 MHz, enabling Ligado to undertake terrestrial downlink operations throughout a 10 MHz LTE channel in the 1670 – 1680 MHz band.[7] The revised proposal, as set forth in a recent filing,[8] contains a number of modifications to Ligado's initial petition, including the addition of power limits, out-of-band emission caps, and other license restrictions.[9] According to Ligado, these modifications are intended to reflect a reorganization of Ligado's terrestrial operations following its agreement with affected GPS providers as it seeks to realize a new nationwide deployment of base stations.[10]

As the *Ligado Public Notice* observes, the 1675 – 1680 MHz spectrum band already serves multiple government and commercial uses and is adjacent to still other sensitive uses.[11] For example, NOAA receives data from geostationary operational environmental satellites ("GOES") that transmit data in the 1673 – 1694.5 MHz band.[12] The Department of Defense and Department of Interior also receive data from GOES systems.[13] Moreover, the next generation of GOES satellites, called GOES-R satellites, will go into use at some point this year.[14] GOES-R will be adjacent to the 1675 – 1680 MHz band, and will extend 300 KHz into it. In addition,

---

[7] *See* Ligado Petition at 7-8.

[8] See generally Waldron Letter.

[9] *Id*. at 3.

[10] *Id*. at 1.

[11] Ligado Public Notice at 2-3.

[12] *Id*. at 3.

[13] *Id*. at 3.

[14] *See* Commerce Spectrum Management Advisory Committee, *Final Report: Working Group 1 – 1695 – 1710 MHz Meteorological-Satellite* at 5 (Jan. 22, 2013), https://www.ntia.doc.gov/files/ntia/publications/wg_1_report.pdf ("*CSMAC Report*").

polar-orbiting satellites ("POES") operated by NOAA, the Department of Defense, and the Department of Interior all transmit data in the 1695 – 1710 MHz band.[15] The frequencies associated with these GOES and POES satellites must be protected from external sources of co-channel and adjacent channel signals due to the national security purposes of these systems.[16]

Recognizing this, before AWS-3 licenses were offered in Auction 97, the Commerce Spectrum Management Advisory Committee ("CSMAC") developed a framework to ensure that established federal users would remain protected after the Commission auctioned rights to use AWS-3 spectrum.[17] CMSAC's Working Group 1 ("WG-1") identified special "protected zones" around relevant meteorological earth stations within which commercial operators in the 1695 – 1710 MHz band would be required to coordinate usage with established federal users.[18] WG-1 also created a set of specific thresholds for the amount of interference acceptable for each earth station—effectively establishing a maximum amount of interference to government systems that may be created by AWS-3 licensees.[19] The Commission adopted WG–1's proposed guidelines into its rules *before* commencing Auction 97.[20]

---

[15] *See* NTIA, *Transition Plans and Transition Data for the 1695 – 1710 MHz Band* (Oct. 29, 2015), https://www.ntia.doc.gov/other-publication/2015/transition-plans-and-transition-data – 1695 – 1710-mhz-band.

[16] *See* 47 C.F.R § 2.106, note US 88 for a list of the facilities to be protected.

[17] *See generally* CSMAC Report.

[18] *Id.*, App. 7.

[19] *Id*.

[20] *See* 47 C.F.R. § 27.1134(c); *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695 – 1710 MHZ, 1755 – 1780 MHz, and 2155- 2180 MHz Bands, Report and Order*, 29 FCC Rcd 4610, 4617-18, 4692-93 (2014) ("*AWS-3 Report and Order*"). Under the Commission's Rules, coordination is required within the protection zones for devices with a maximum Effective Isotropic Radiated Power ("EIRP") of 20 dBm or less. For devices with an EIRP of more than 20 dBm up the maximum 30 dBm, coordination is required nationwide. *See* 47 C.F.R. § 27.1134(c).

III. DISCUSSION

Ligado's proposal raises serious concerns about the efficient use of the AWS-3 spectrum acquired in Auction 97. Adoption of the proposal would reduce the rights of AWS-3 licensees to more limited operations in and around the protected zones identified and established by the CSMAC and the Commission before Auction 97, would require AWS-3 licensees to make additional expenditures to address the new interference, would reduce the ability of federal users to identify and remedy sources of interference, and would result in an inequitable benefit to non-AWS-3 licensees unless the Commission acts to require compensation.

a. If the Ligado Proposal were Adopted, the New Licensee's Base Stations Would Appropriate a Portion of CSMAC's Interference Budget from the AWS-3 Licensees for Which it was Developed

Should the Commission eventually resolve to adopt the Ligado Proposal, existing AWS-3 licensees would be forced to constrain their own operations beyond what CSMAC contemplated to ensure that the total interference caused to federal users remains under the required thresholds. Participants in Auction 97 bid for AWS-3 spectrum bid with the expectation that only their operations would be subject to the restrictions reflected in the CSMAC report. The AWS-3 interference analysis conducted by CSMAC's WG-1 did not consider the impact of commercial downlink operations in the 1675 – 1680 MHz band,[21] and the Commission's corresponding rules do not reflect such operations.[22] Nevertheless, the interference generated by Ligado's proposed operations would count against the interference thresholds established by the Commission,

[21] *See Federal Communications Commission and the National Telecommunications And Information Administration: Coordination Procedures in the 1695 – 1710 MHz and 1755 – 1780 MHz Bands*, Public Notice, 29 FCC Rcd 8527 (2014) (setting coordination procedures for the 1695 – 1710 MHz band without reference to Ligado's proposals); *CSMAC Report* at 7 ("WG-1 recommends that NTIA work with the FCC to ensure any rules promulgated for the 1695 – 1710 MHz spectrum limit the use of this spectrum for commercial operators to mobile transmit.").

[22] *See* 47 C.F.R. § 27.1134(c).

appropriating a portion of the CSMAC interference budget adopted by the Commission for AWS-3 licensees before Auction 97. Northstar Wireless respectfully asks that the Commission consider these potential harms as it evaluates whether to permit additional users in the 1675 – 1680 MHz band.

In support of its proposal, Ligado has commissioned the Alion Science and Technology Task Reports, which specified protection zones for federal entities' earth stations within which it would coordinate its own base station placements and operations with federal entities.[23] However, that proposed coordination would not change the fact that Ligado's base stations would contribute to the interference threshold—appropriating a portion of the interference budget from the AWS-3 licensees for which it was developed—and impose a new, unanticipated burden on AWS-3 licensees. Addressing that burden could force AWS-3 licensees to limit the number of mobile units that could operate within or outside the coordination zones, and/or require AWS-3 licensees to build more base stations to limit the aggregate power of mobile stations to lower levels than anticipated. In sum, the threshold levels originally allocated exclusively to the AWS-3 licensees would potentially become subject to redistribution among even more users, reducing the utility and value of the AWS-3 licenses for which the levels were developed.

b. Adoption of Ligado's Proposal Would Require AWS-3 Licensees to Make Unanticipated Expenditures to Mitigate Resulting Interference

Other interference issues arise with respect to protecting AWS-3 licensee transmissions. Mitigation of these interference issues could introduce a host of secondary problems. Under

[23] Alion Science and Technology, *Assessment of the Potential for LightSquared Broadband Base Stations in the 1670 – 1680 MHz Band To Interfere with Select NOAA Legacy Ground Locations* (February 2014), http://apps.fcc.gov/ecfs/document/view?id=7521098269 ("*Alion Task 2 Reports*").

many common deployment scenarios, Ligado's base station transmissions in the 1675 – 1680 MHz band would cause interference to AWS-3 licensees' base station receivers at 1695 – 1710 MHz because there would be just 15 MHz of separation between the Ligado's base transmit frequency and AWS-3 licensees' transmit frequency. This arrangement would cause siting issues because any co-location of AWS-3 and Ligado base stations on the same tower or rooftop would likely require technical measures to be taken to reduce interference, such as installing external filters that would make AWS-3 operations more expensive and reduce performance.

Moreover, unless standard 3GPP coexistence guidelines are relaxed, AWS-3 licensees would need to add filtering solutions to mobile units operating in the affected spectrum to mitigate interference to mobile units receiving in the 1675 – 1680 MHz band, causing additional expense and inhibiting battery life in AWS-3 mobile units. As imposed by international standards body 3GPP, the standard coexistence criteria for mobile device transmissions into a neighboring band is set at a value of -50 dBm/MHz, while the standard value for base stations is -49 dBm/MHz. The fact that these operations would be separated by a mere 15 MHz would make it impossible to meet these standards without additional filtering. Filtering solutions are much more easily implemented for base stations than for mobile units because filters require power and space. Additionally, there are far more mobile units than base stations operating in a nationwide mobile network, making it more costly to implement a filtering solution at the mobile unit level.

c. Adoption of Ligado's Proposal Would Make it Difficult for Federal Users to Identify and Remedy Sources of Interference

Further, the remaining federal users would likely be unable to determine whether interference to their systems originated from AWS-3 licensees or Ligado's proposed base stations. Ligado's deployment of base stations, in combination with AWS-3 licensee operations

would make it difficult, if not impossible, to determine whether any potential interference caused to federal users resulted from Ligado's operations or from those of AWS-3 licensees. When there are two potential sources of interference from operations in two different bands, it is not always possible to identify the offending party. Moreover, the possible remedies to interference caused by uplink operations are different than those caused by downlink operations, making it costly and inefficient to trouble shoot interference issues. If the Commission adopts the Ligado Proposal, it should require Ligado to cover the costs incurred by AWS-3 licensees whose operations would be impaired by transmissions from Ligado's base stations.[24]

d. Adoption of Ligado's Proposal Would Allow Ligado to Unjustly Benefit from AWS-3 Licensees' Contributions Toward Federal Users' Spectrum Sharing Costs Unless the Commission Takes Appropriate Compensatory Measures

In addition to the unanticipated costs to AWS-3 licensees and the difficulty in attributing and mitigating interference to federal users, Ligado's proposal does not explain how it would contribute toward the expenses incurred by federal users as they prepare to share the spectrum in which they operate. These expenses include the costs of relocating radiosondes and equipping earth stations with RF monitoring capabilities.[25] The Commission designated a portion of the proceeds from Auction 97 to pay for just such expenses to ensure that the winning bidders

[24] *See, e.g., Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service, et al., Third Report and Order and Third Memorandum Opinion and Order*, 18 FCC Rcd 23638, 23644 ¶ 9 (2003) (requiring new licensees in a band that benefitted from the relocation of incumbent licensees out of the band to share the incumbents' relocation costs).

[25] *See, e.g.,* Letter from the Honorable Lawrence E. Strickling, Assistant Secretary for Communications and Information, United States Department of Commerce, to the Honorable Tom Wheeler, Chairman, Federal Communications Commission (May 13, 2014) at Attachment B1 https://www.ntia.doc.gov/files/ntia/publications/notification_to_fcc_re_est_costs_for_1695_and_1755_bands_05132014.pdf.

equitably shouldered the financial burden.[26] Ligado's proposal, if adopted without appropriate compensatory measures, would enable those who have not contributed toward federal users' spectrum sharing costs to reap the benefits of Auction 97 winners' investments in the federal users' spectrum sharing capabilities.

IV. CONCLUSION

As the Commission considers whether to initiate a rulemaking on the Ligado Petition, it should carefully consider the consequences of the implementation of that proposal on AWS-3 commercial licensees. Adoption of Ligado's proposal would likely limit the base station deployment capabilities of AWS-3 commercial licensees, generate interference requiring potentially costly remediation steps on the part of AWS-3 commercial licensees, and enable Ligado—or whomever may acquire the rights it seeks—to benefit from Auction 97 winning bidders' expenditures in reimbursing federal users for their spectrum sharing costs. Moreover, it would create challenges for federal users in identifying the source of any excessive interference and ameliorating it. For these reasons, the Commission should ensure that any resulting rulemaking proceeding includes robust measures to protect the investments and operations of these existing AWS-3 licensees.

[26] *See AWS-3 Report and Order*, 29 FCC Rcd at 4615 – 17; *Auction of Advanced Wireless Services (AWS-3) Licenses Scheduled for November 13, 2014; Notice and Filing Requirements, Reserve Prices, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 97, Public Notice*, 29 FCC Rcd 8386, 8401-02 (2014). *See also* https://www.ntia.doc.gov/category/aws-3-transition.

Respectfully submitted,

NORTHSTAR WIRELESS, LLC

By: */s/ Mark F. Dever*
Mark F. Dever
Anthony D. Glosson*

**Admitted in Maryland only. District of Columbia Bar application pending; practice supervised by partners of the firm who are active D.C. Bar members pursuant to D.C. Bar Rule 49(c)(8).*

DRINKER BIDDLE & REATH LLP
1500 K Street, N.W.
Washington, DC 20005
(202) 842-8800 office
(202) 842-8465 fax
Mark.Dever@dbr.com

Its Attorneys

June 21, 2016